
Woven polypropylene sacks for bulk packaging of foodstuffs

*Sacs tissés en polypropylène pour l'emballage en vrac de denrées
alimentaires*

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ISO 23560:2015

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 61, *Plastics*, Subcommittee SC 11, *Products*.

This second edition cancels and replaces the first edition (ISO 23560:2008), which has been technically revised.

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Introduction

With the removal of trade barriers between nations, there is a need for an International Standard for the packaging, transportation, and storage of foodstuffs such as cereals. Polypropylene (PP) sacks made from woven fabric are an ideal choice for the packaging of foodstuffs. Such sacks are produced from food-grade polypropylene and ensure the mechanical strength needed for storage and transportation.

This International Standard describes the construction of the sacks, their dimensions, and test methods suitable for ensuring the long-term storage and transportation of foodstuffs in the sacks.

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Woven polypropylene sacks for bulk packaging of foodstuffs

1 Scope

This International Standard specifies the general characteristics, requirements, and methods of test for woven polypropylene (PP) sacks. It is applicable to woven PP sacks, having a capacity of 50 kg or 25 kg, intended for the transport and storage of foodstuffs, such as cereals, sugar, and pulses.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 291, *Plastics — Standard atmospheres for conditioning and testing*

ISO 3451-1:2008, *Plastics — Determination of ash — Part 1: General methods*

ISO 4892-3:2013, *Plastics — Methods of exposure to laboratory light sources — Part 3: Fluorescent UV lamps*

ISO 4915, *Textiles — Stitch types — Classification and terminology*

ISO 6591-2, *Packaging — Sacks — Description and method of measurement — Part 2: Empty sacks made from thermoplastic flexible film*

ISO 13934-1, *Textiles — Tensile properties of fabrics — Part 1: Determination of maximum force and elongation at maximum force using the strip method*

ISO 13935-1, *Textiles — Seam tensile properties of fabrics and made-up textile articles — Part 1: Determination of maximum force to seam rupture using the strip method*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

woven PP sack

container made of woven polypropylene (PP) fabric, closed at one end, in certain cases combined with other flexible materials used, for instance, for the liner to provide the properties required for filling, storage, and distribution of the packaged commodity

4 Manufacture

4.1 Raw materials

A suitable grade of PP conforming to food contact requirements shall be utilized in the manufacture of the PP tape/fabric used in the sacks.

4.2 Fabric

The fabric used in the manufacture of woven PP sacks shall be woven as a tube on a circular loom from PP tapes having a width of $(2,5 \pm 1)$ mm. The tapes shall be woven sufficiently tight so that the packaged foodstuff does not leak out of the sack. The construction of the weave shall be sufficiently rough to ensure that filled sacks do not slip from a stack of sacks.

The required construction parameters of sacks are given in [Table 1](#).

Table 1 — Required construction parameters of fabric and sacks

Parameter		Requirement		Test method
		Type 1	Type 2	
Capacity (kg)		50	25	—
Dimensions (cm)	Inside length	100 ⁺² / ₀	65 ⁺² / ₀	ISO 6591-2
	Inside width	57 ⁰ / ₋₁	48 ⁰ / ₋₁	
Mass of sack (g)		135 ⁺⁹ / ₋₄	67 ⁺⁴ / ₋₃	See Annex A
Average breaking strength of fabric (N)	Lengthwise	≥918	≥816	See Annex B
	Widthwise	≥918	≥816	
Elongation at break of fabric (%)	Lengthwise	(20 ± 5)	(20 ± 5)	See Annex B
	Widthwise	(20 ± 5)	(20 ± 5)	
Average breaking strength of bottom seam (N)		≥377	≥337	See Annex B
Ash content (for UV stabilized fabric)		3 % max	3 % max	ISO 3451-1:2008, Method A, at 600 °C ± 25 °C
NOTE 1 The dimensions specified provide the optimum free space of at least 20 % of the length above the surface of the contents.				
NOTE 2 The masses given for the sacks are based on typical ones for fabric weighing 106 g/m ² for type 1 sacks and 96 g/m ² for type 2 sacks.				
NOTE 3 The average breaking strength of the fabric and the average breaking strength of the bottom seam are calculated with respect to a specimen width of 50 mm.				

Woven PP sacks of the dimensions specified in [Table 1](#) are suitable for the packaging of foodstuffs such as wheat, rice, pulses, millet, and other similar grains. Other sack dimensions are allowed by agreement between the purchaser and seller. The mass of such sacks shall be calculated by the method given in [Annex A](#).

5 Sack

5.1 The sack can be flat or gusseted.

5.2 The bottom seam shall be stitched with two rows of chain stitches in accordance with ISO 4915. The two rows of stitches shall be separated from each other by at least 4 mm and the outer stitch shall be at least 7 mm from the outer edge of the sack. The stitching shall be done through a single or double fold so that the stitches pass through a minimum of four layers of the fabric, made in such a way that the seam width is at least 25 mm. The number of stitches per unit length shall be (14 ± 2) stitches/dm. These requirements shall be verified by visual inspection.

5.3 The material used for stitching shall be polypropylene tape or any other thread suitable for the purpose. The stitching shall be uniform with no loose thread or knots. These requirements shall be verified by visual inspection.

5.4 The closure of the filled sack shall be designed to prevent leakage of the contents during transport and handling.

6 Liner

If required by the buyer, the unlaminated sacks shall be provided with a loose liner made of a suitable polyolefin film conforming to the requirements for food contact. The width of the liner shall be 10 % more than the width of the sack. The bottom seam of the liner shall be at least 25 mm from its bottom edge. The liner shall be free from pinholes, patches, tears, blisters, and other visible defects.

7 Requirements

7.1 Conditioning and test conditions

The atmospheres for conditioning and testing shall be as specified in ISO 291.

7.2 Construction parameters

The sacks shall conform to the requirements specified in [Table 1](#), within the limits specified in [10.2](#).

7.3 UV resistance

Sacks made of UV-stabilized fabric shall retain at least 50 % of their original breaking strength when tested (see [Annex B](#)) after exposure to UV radiation and weathering for 144 h in accordance with the procedure given in ISO 4892-3:2013, [Table 4](#), method A, cycle No. 1.

7.4 Mass of the bale

The mass of a bale of sacks (excluding packing material) shall be within ± 3 % of the mass calculated by multiplying the number of sacks by the mass specified in [Table 1](#) for one sack.

7.5 Drop testing

When tested in accordance with [Annex C](#), sacks shall meet the requirements specified in that annex.

8 Food compatibility

When used for foodstuffs, as will normally be the case, the sacks shall meet the legal requirements for food contact of the country where they are to be used.

9 Marking and packaging

9.1 Marking on sacks

The identification mark of the manufacturer, along with any information required by the buyer, shall be printed on the sacks, using ink or another suitable method that will ensure legibility during use.